

Applicants: SLAPAK, Alon *et al.*  
Serial Number: 10/573,060

Attorney Docket: P-6129-US

### REMARKS

Applicants assert that the claimed invention is new, non-obvious, and useful. Favorable reconsideration and allowance of the application are respectfully requested in view of the foregoing amendments and following remarks.

### Status of the Claims

Claims 1-31 are pending in the application.

Claims 1, 16, 18 and 29-30 have been amended, to more clearly define what the Applicants regard as some embodiments of the invention.

No new matter has been added.

### Claim Rejections under 35 U.S.C. §103(a)

#### With regard to claims 1-13 and 16-31:

The Office Action rejected claims 1-13 and 16-13 under 35 U.S.C. §103(a) as being unpatentable over Wan, United States Patent Number 5,978,489 ("Wan") in view of Wright, United States Patent Application Publication Number 2003/0103635 ("Wright").

Applicants respectfully submit that Wan and Wright, taken individually or in combination, do not disclose or describe all of the features of independent claims 1 and 18, as currently amended, and consequently cannot render obvious claims 1 and 18 or the claims dependent thereon.

Independent claim 1, as currently amended, recites, *inter alia*, -

**"wherein the noise destructive pattern produced by the acoustic transducer has a non-linear relationship to the noise pattern sensed by the acoustic sensor"**

This feature is not disclosed by Wan and/or Wright.

Similarly, independent claim 18, as currently amended, recites, *inter alia*, -  
**“wherein the noise destructive pattern produced by the controller  
has a non-linear relationship to the noise pattern sensed by the  
primary acoustic sensor”**

This feature is not disclosed by Wan and/or Wright.

Applicants note that Wan clearly describes only Finite Impulse Response (FIR) and Infinite Impulse Response (IIR) systems (see, for example, Wan, column 3, lines 44-45; Wan, column 3, line 50; Wan, column 3, lines 62-63; Wan, column 3, lines 65-66).

Similarly, Wright clearly describes only Finite Impulse Response (FIR) and Infinite Impulse Response (IIR) systems (see, for example, Wright, paragraphs 0015, 0017, 0029, 0039, 0041, 0058, 0069, 0080, 0085, 0086).

It is well known in the art that utilization of FIR filters and/or IIR filters – unless explicitly referring to “**nonlinear FIR**” or “**nonlinear IIR**” – clearly indicates a linear relationship between the signal sensed by the microphone and the destructive pattern produced by the speaker.

Additionally, Wan and Wright fail to disclose and utilize any “nonlinear FIR filter” or any “nonlinear IIR filter”, and fail to disclose and utilize any other nonlinear relationship between the signal sensed by the microphone and the destructive pattern produced by the speaker.

In contrast, independent claims 1 and 18, as currently amended, recite a **nonlinear relation** between the signal sensed by the microphone and the destructive pattern produced by the speaker.

This feature of independent claims 1 and 18 has ample basis in the specification as originally filed; see, for example, paragraphs 0006, 0031, 0035, 0101 of the present application as published.

It is noted that **Section 5 of the Office Action** states, that the combination of Wan and Wright fails to disclose the “non-linear function” of previous claim 14. Applicants respectfully submit that similarly, Wan and Wright fail to disclose the **non-linear relation** between the sensed signal and the destructive pattern, as recited in independent claims 1 and 18, as currently amended.

It is noted that the above-mentioned distinguishing features are not merely “semantic”, but rather **functional**. Wan and Wright took the simple approach, of trying to predict noise using linear models; whereas the claimed invention is able to predict and cancel noise using **advanced non-linear algorithms**, thereby modeling the noise phenomena more accurately and achieving **improved noise reduction**.

Applicants further note that dependent claims 16 and 31, as currently amended, further recite, in paraphrase, that “the noise destructive pattern produced by the acoustic transducer has an exponential relationship to the noise pattern sensed by the acoustic sensor”; this feature, too, is not disclosed by Wan and/or Wright.

In view of the above, the combination of Wan and Wright does not render obvious independent claims 1 and 18, as currently amended.

Applicants respectfully submit that these features of independent claims 1 and 18, as currently amended, would not have been obvious to a person skilled in the art at the time the invention was made in view of any of the references on record, taken individually or in any combination.

In view of the above, Applicants respectfully submit that independent claims 1 and 18 are novel and patentable. In addition, it is respectfully submitted that dependent claims 2-13, 16-17 and 19-31 are likewise novel and patentable at least by virtue of their dependency on amended independent claims 1 or 18.

Applicants respectfully request that the rejection of claims 1-13 and 16-31 under 35 U.S.C. §103(a) be withdrawn.

**With regard to claims 14-15:**

The Office Action rejected claims 14-15 under 35 U.S.C. §103(a) as being unpatentable over the combination of Wan, Wright and Wang, United States Patent Number 5,812,973 ("Wang").

Applicants submit that **Wang cannot be used in combination with Wan and Wright for the purpose of rejecting the claimed invention**: Wan and Wright are clearly publications in the field of **noise cancellation**, whereas Wang is clearly a publication in the **entirely distinct of speech recognition**. These fields are entirely distinct.

Applicants respectfully submit that at the time the invention was made, a person of ordinary skill in the art **would not have reasonably combined** the teachings of Wan and Wright (from the field of noise cancellation) with the teachings of Wang (from the field of speech recognition); and such person **would not have had any motivation** to do so, nor do these references suggest any motivation for such combination, and **nor does the Office Action indicate any motivation** for such combination of references from distinct fields.

The Office Action **merely contends** that it would have been obvious to a person of ordinary skill in the art to modify the combination of Wan and Wright by using the function of Wright "wherein the function comprises a non-linear function for purpose of determining accurately the feature of a set of samples of spoken word". Applicants respectfully disagree, and submit that precisely for this reason it would not have been obvious to perform such modification – precisely because the system of Wang uses the non-linear function "for the purpose of determining accurately the feature or a set of samples of spoken word", and not for other purposes, and does not even attempt to determine or cancel noise.

It is well known in the art that the field of noise cancelation is **fundamentally distinct** from the entirely-different field of speech recognition. Applicants respectfully submit that it is **not sufficient** for the Office Action to pick a reference (Wang) which merely mentions the use of a non-linear function for the purpose of **speech recognition**, and to "transfer" that process to the different art of **noise cancelation**.

Applicants further submit that utilization of non-linear functions in speech recognition, as described briefly by Wang, was an **internal feature** of the field of speech recognition, in which **there exists an utmost importance to accurately determine the spoken word**, in order to **match** the sensed audio signals with **dictionary-based data of words**. This is **in contrast** to the field of noise cancelation, in which, at the time the invention was made, there was **neither motivation nor teaching** to utilize non-linear algorithms **for the purpose of noise cancelation**.

Applicants respectfully point out that it is not a mere coincidence that the Office Action failed to find even single publication from **the field of noise cancelation** (or even from the field of noise detection) which discloses utilization of non-linear relation between the sensed noise and the destructive pattern. In fact, at the time the invention was made, **the art in the field of noise cancelation was actually teaching away from the claimed invention, by explicitly and repeatedly teaching that linear models are to be used** (as evidenced by the repetitive reference of Wan and Wright to linear models, as detailed above). This teaching away is **an additional reason** for the inappropriateness of combining Wan and Wright with Wang.

Without conceding the appropriate of the combination of Wan and Wright with Wang, Applicants respectfully submit that **even the inappropriate combination** Wan, Wright and Wang fails to disclose all the exact features of independent claim 1, as currently amended, and consequently does not render obvious claim 1 or the claims dependent thereon.

Independent claim 1, as currently amended, recites, *inter alia*, -

**"wherein the noise destructive pattern produced by the acoustic transducer has a non-linear relationship to the noise pattern sensed by the acoustic sensor"**

This feature is not disclosed even by the combination of Wan, Wright and Wang.

Applicants respectfully submit that a very careful reading of this feature, shows that even the combination of Wan, Wright and Wang does not disclose this feature. The combination of Wan, Wright and Wang does not disclose any "noise destructive pattern" which has a "non-linear relationship" to the detected "noise pattern". Wan and Wright describe, at most, linear relations; whereas Wang simply mentions the usage of non-linear function in the context of speech recognition.

Applicants respectfully submit that Wang thus fails to cure the deficiency of Wan and Wright: even the combination of Wang with Wan and Wright, still does not teach any "noise destructive pattern" which has a "non-linear relationship" to the detected "noise pattern".

In view of the above, even the inappropriate combination of Wan, Wright and Wang does not render obvious independent claim 1, as currently amended.

In view of the above, Applicants respectfully submit that independent claim 1 is novel and patentable. In addition, it is respectfully submitted that dependent claims 14-15 are likewise novel and patentable at least by virtue of their dependency on amended independent claim 1.

Applicants respectfully request that the rejection of claims 14-15 under 35 U.S.C. §103(a) be withdrawn.

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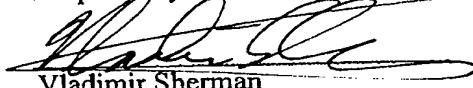
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**Conclusion**

In view of the foregoing amendment and remarks, the pending claims are deemed to be allowable. Their favorable reconsideration and allowance is respectfully requested.

No fees are believed to be due in connection with this paper. If any fees are in fact due in connection with this paper, please charge any such fees to deposit account No. 50-3400

Respectfully submitted,



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